WHAT IS CLAIMED IS:

1. A process of producing a polymer comprising:

(a) providing hydroxyl-carboxyl protomers; and

(b) condensing said hydroxyl-carboxyl protomers to form the polymer.

2. The process of claim 1, wherein at least one of said hydroxyl-carboxyl protomers has a structure of:

$$Y\text{-}CHR_aCOOH$$

wherein:

Y is a proteinaceous material, OH or NH_2; and

R_a is selected from the group consisting of $-(CH_2)_3$-NH-C(NH_2)(=NH), $-(CH_2)_3$-NH-C(OH)(=NH), $-(CH_2)_4NH_2$, $-(CH_2)_4OH$, $-CH_2OH$, $-CHOHCH_3$, $-CH_2-C_6H_4$ p-OH, $-CH_2CONH_2$, $-CH_2COOH$, $-(CH_2)_2CONH_2$, $-(CH_2)_2COOH$, $-CH_2SH$, –H, $-CH_3$, $-CH_2$c(C=CH-N=CH-NH-), $-CH(CH_3)CH_2CH_3$, $-CH_2CH(CH_3)_2$, $-(CH_2)_2SCH_3$, $-CH_2C_6H_5$, $-CH_2$-c(C=CH-NH-Ph-), and $-CH(CH_3)_2$.

3. The process of claim 1, wherein at least one of said hydroxyl-carboxyl protomers has a structure

$$Y\text{-}CHRaCO\text{-}[NHRnCO]n\text{–}NHRcCO\text{-}OH$$

wherein:

n is 0 or a positive integer;

Y is a proteinaceous material, OH or NH_2; and

R_a, R_c and each one of R_n is independently selected from the group consisting of $-(CH_2)_3$-NH-C(NH_2)(=NH), $-(CH_2)_3$-NH-C(OH)(=NH), $-(CH_2)_4NH_2$, $-(CH_2)_4OH$, $-CH_2OH$, $-CHOHCH_3$, $-CH_2-C_6H_4$ p-OH, $-CH_2CONH_2$, $-CH_2COOH$, $-(CH_2)_2CONH_2$, $-(CH_2)_2COOH$, $-CH_2SH$, –H, $-CH_3$, $-CH_2$c(C=CH-N=CH-NH-), $-CH(CH_3)CH_2CH_3$, $-CH_2CH(CH_3)_2$, $-(CH_2)_2SCH_3$, $-CH_2C_6H_5$, $-CH_2$-c(C=CH-NH-Ph-), and $-CH(CH_3)_2$.

4. The process of claim 1, wherein said providing said hydroxyl-carboxyl protomers comprises:

(i) providing a protein-containing substrate; and either or both

(ii) replacing primary amines of proteinaceous components of said protein-containing substrate with hydroxyl groups; and / or

(iii) replacing amide groups of proteinaceous components of said protein-containing substrate with carboxyl groups;

so as to make said protomers from said proteinaceous components.

5. The process of claim 4, wherein said providing said hydroxyl-carboxyl protomers comprises:

(i) providing a protein-containing substrate; and

(ii) replacing primary amines of proteinaceous components of said protein-containing substrate with hydroxyl groups;

so as to make said protomers from said proteinaceous components.

6. The process of claim 4, wherein said providing said hydroxyl-carboxyl protomers comprises:

(i) providing a protein-containing substrate; and

(ii) replacing amide groups of proteinaceous components of said protein-containing substrate with carboxyl groups;

so as to make said protomers from said proteinaceous components.

7. The process of claim 4, wherein said protein containing substrate is selected from the group consisting of plant products, grain-products, pulse-products, leaves, animal products, dairy products, milk, cheese, eggs, egg whites, abattoir waste, blood, fishery waste, meat products and microbial sludge.

8. The process of claim 4, wherein prior to said replacing, proteinaceous compounds in said protein containing substrate are hydrolyzed.

9. The process of claim 8, wherein said hydrolysis is enzymatic hydrolysis.

10. The process of claim 8, wherein said hydrolysis is chemical hydrolysis.

11. The process of claim 4, wherein said replacing comprises reacting said proteinaceous compounds with nitrous acid or nitrous oxides.

12. The process of claim 11, wherein said reacting takes place in an aqueous reaction solution.

13. The process of claim 12, wherein said reacting takes place at a temperature of less than about 55°C.

14. The process of claim 12, wherein said reacting takes place at a temperature of less than about 45°C.

15. The process of claim 12, wherein said reacting takes place at a temperature of less than about 30°C.

16. The process of claim 12, wherein said reacting takes place at a temperature of less than about 20°C.

17. The process of claim 12, wherein said reacting takes place at a temperature of greater than about 0°C.

18. The process of claim 12, wherein said reacting takes place at a temperature of greater than about 5°C.

19. The process of claim 12, wherein the pH of said aqueous reaction solution is less than about 7.

20. The process of claim 12, wherein the pH of said aqueous reaction solution is less than about 6.

21. The process of claim 12, wherein the pH of said aqueous reaction solution is less than about 5.

22. The process of claim 12, wherein the pH of said aqueous reaction solution is greater than about 1.

23. The process of claim 12, wherein the pH of said aqueous reaction solution is greater than about 2.

24. The process of claim 12, wherein the pH of said aqueous reaction solution is greater than about 3.

25. The process of claim 12, wherein the pH of said aqueous reaction solution is adjusted by the addition of at least one compound, said at least one compound being selected from the group consisting of amine, carboxylic acid and a conjugate base of a carboxylic acid.

26. The process of claim 25, wherein said at least one compound comprises a carboxyl functional group at least one additional functional group.

27. The process of claim 26, wherein said at least one additional functional group is selected from the group consisting of hydroxyl, carboxyl, amide, ester, cyclic amide, cyclic ester and amine.

28. The process of claim 26, wherein said at least one compound is selected from the group consisting of aconitic acid, lactic acid, malic acid, aminovaleric acid, amincaproic acid and glycolic acid.

29. The process of claim 25, wherein said at least one compound comprises an amino functional group at least one additional functional group.

30. The process of claim 29, wherein said at least one additional functional group is selected from the group consisting of hydroxyl, carboxyl, amide, ester, cyclic amide, cyclic ester and amine.

31. The process of claim 29, wherein said at least one compound is selected from the group consisting of putrescine and cadaverine.

32. The process of claim 12, wherein subsequent to said replacing, said protomers are extracted from said aqueous reaction solution.

33. The process of claim 32, wherein said extraction is performed by removing water from said aqueous reaction solution.

34. The process of claim 33, wherein said removal of said water is performed by a method selected from the group consisting of evaporation of water, sublimation of water, freeze-drying of said reaction solution, spray drying of said reaction solution, filtering said reaction solution, and osmosis.

35. The process of claim 32, wherein said extraction is performed by a method selected from liquid-liquid extraction using tertiary amines, liquid-liquid extraction using organo-phosphate compounds and solid-phase extraction.

36. The process of claim 1, wherein said condensing is reaction of a hydroxyl group of a first protomer with a carboxyl group of a second protomer so as to form an inter-protomer ester bond.

37. The process of claim 36, wherein said condensing is performed at a temperature of lower than about 180°C.

38. The process of claim 36, wherein said condensing is performed at a temperature of lower than about 150°C.

39. The process of claim 36, wherein said condensing is performed in the presence of a catalyst.

40. The process of claim 39, wherein said catalyst is selected from the group of transesterifcation, esterification, transamidation and amidation catalysts.

41. The process of claim 39, wherein said catalyst is selected from the group consisting of titanium compounds, Ti(IV) compounds, tin compounds, Sn (IV) compounds, antimony compounds, Sb(III), magnesium compounds, Mg(II) compounds, lead compounds, Pb(III) compounds, zinc compounds, Zn(II) compounds, zirconium compounds, Zr(IV) compounds, zeolites, NaX faujasite zeolites and ETS-10 zeolites.

42. The process of claim 39, wherein said catalyst is selected from the group consisting of tetraorganodistannoxanes, 1,1,3,3-tetrabutyldichlorodistannoxane, Bu_2SnO, bis-(2-ethylhexanoate)-tin, TiO_2, $Mg(OEt)_2$, Sb_2O_3, tetra-isopropyl titanate, titanium acetylacetonate (bis(pentane-2,4-dionato-O,O') bis (alkanolato) titanium and zirconium tetra-n-butanolate.

43. A process of producing a polymer comprising:

(a) providing hydroxyl-carboxyl protomers;

(b) providing at least one copolymer;

(c) combining said hydroxyl-carboxyl protomers with said at least one copolymer to make a precursor mix; and

(d) condensing molecules in said precursor mix to form the polymer.

44. The process of claim 43, wherein said condensing is reaction of a hydroxyl group of a first protomer with a carboxyl group of a second protomer so as to form an inter-protomer ester bond.

45. The process of claim 43, wherein said condensing is a bond-forming reaction of a first functional group of a first protomer with a second functional group of a copolymer molecule.

46. The process of claim 45, wherein from amongst said first functional group and said second functional group, one functional group is an amine and the other functional group is a carboxyl functional group, and said bond formed is an amide bond.

47. The process of claim 45, wherein from amongst said first functional group and said second functional group, one functional group is a hydroxyl and the other functional group is a carboxyl functional group, and said bond formed is an ester bond.

48. The process of claim 43, wherein said condensing is bond-forming reaction of a first functional group of a first protomer with a second functional group of a copolymer molecule and a bond-forming reaction of a third functional group of a second protomer with a fourth functional group of said copolymer molecule.

49. The process of claim 48, wherein from amongst said first functional group and said second functional group, one functional group is an amine and the other functional group is a carboxyl functional group, and said bond formed is an amide bond.

50. The process of claim 48, wherein from amongst said first functional group and said second functional group, one functional group is a hydroxyl and the other functional group is a carboxyl functional group, and said bond formed is an ester bond.

51. The process of claim 48, wherein from amongst said third functional group and said fourth functional group, one functional group is an amine and the other

functional group is a carboxyl functional group, and said bond formed is an amide bond.

52. The process of claim 48, wherein from amongst said third functional group and said fourth functional group, one functional group is a hydroxyl and the other functional group is a carboxyl functional group, and said bond formed is an ester bond.

53. The process of claim 43, wherein said copolymer is monofunctional, having only one functional group.

54. The process of claim 53, wherein said one functional group is selected from the group consisting of carboxyls, hydroxyls, esters, cyclic esters, amides, cyclic amides, and amines.

55. The process of claim 53, wherein said copolymer is selected from the group consisting of acetic acid, formic acid, methanol and ethanol

56. The process of claim 43, wherein said copolymer is monofunctional, having at least two functional groups.

57. The process of claim 56, wherein said at least two functional groups are each independently selected from the group consisting of carboxyls, hydroxyls, esters, cyclic esters, amides and cyclic amides.

58. The process of claim 56, wherein said copolymer is selected from the group consisting of polyamines, polyamides, polyesters, polyurethanes, polycarboxylic acids, polyalcohols, polyurethanes, amino acids, amino alcohols, alcohol acids, ε-caprolactame, lactic acid, aconitic acid, malic acid, glycolic acid, alkyl amino acids, aminovaleric acid, aminocaproic acid, alkyl diamino compounds, putrescine and cadaverine.

59. The process of claim 43, wherein said condensing is performed at a temperature of lower than about 180°C.

60. The process of claim 43, wherein said condensing is performed at a temperature of lower than about 150°C.

61. The process of claim 43, wherein said condensing is performed in the presence of a catalyst.

62. The process of claim 61, wherein said catalyst is a transesterifcation or esterification catalyst.

63. The process of claim 61, wherein said catalyst is selected from the group consisting of titanium compounds, Ti(IV) compounds, tin compounds, Sn (IV) compounds, antimony compounds, Sb(III), magnesium compounds, Mg(II) compounds, lead compounds, Pb(III) compounds, zinc compounds, Zn(II) compounds, zirconium compounds, Zr(IV) compounds, zeolites, NaX faujasite zeolites and ETS-10 zeolites.

64. The process of claim 61, wherein said catalyst is selected from the group consisting of tetraorganodistannoxanes, 1,1,3,3-tetrabutyldichlorodistannoxane, Bu_2SnO, bis-(2-ethylhexanoate)-tin, TiO_2, $Mg(OEt)_2$, Sb_2O_3, tetra-isopropyl titanate, titanium acetylacetonate (bis(pentane-2,4-dionato-O,O') bis (alkanolato) titanium and zirconium tetra-n-butanolate.

65. A polymer made according to the process of any one of claims 1 to 64.

66. A resin made of the polymer of claim 65.

67. A plastic made of the polymer of claim 65.

68. A plastic product made of the polymer of claim 65.

69. A polymer comprising at least one bond A-B, wherein

A is selected from the group of radicals consisting of:

(NHX)(COY)CH-$(CH_2)_3$-NH-C(=NH)O·
(NHX)(COY)CH-$(CH_2)_4$O·
(NHX)(COY)CH-CH_2O·
(NHX)(COY)CH-$CHCH_3$O·
(NHX)(COY)CH-CH_2-C_6H_4 p-O·
and Y-CO-CHR_A-O·

and

B is selected from the group of radicals consisting of

(NHW)(COZ)CH-CH_2-C(=O)·
(NHW)(COZ)CH-$(CH_2)_2$-C(=O)·
and WNHCHR_BC(=O)·

wherein R_A and R_B are independently selected from the group consisting of: -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4$OH, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2,-CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-) and –$CH(CH_3)_2$ and wherein W, X, Y and Z are independently selected from the group consisting of H or a proteinaceous material.

70. The polymer of claim 69 comprising at least two bonds A-B.

71. The polymer of claim 69 comprising at least five bonds A-B.

72. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$(CH_2)_3$-NH-C(=NH)O· radical; and

B is a (NHW)(COZ)CH-CH_2-C(=O)· radical.

73. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$(CH_2)_4$O· radical; and

B is a (NHW)(COZ)CH-CH_2-C(=O)· radical.

74. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-CH_2O· radical; and

B is a (NHW)(COZ)CH-CH_2-C(=O)· radical.

75. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$CHCH_3O$· radical; and

B is a (NHW)(COZ)CH-CH_2-C(=O)· radical.

76. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-CH_2-C_6H_4 p-O· radical; and

B is a (NHW)(COZ)CH-CH_2-C(=O)· radical.

77. The polymer of claim 69, wherein:

A is a Y-CO-CHR_A-O· radical; and

B is a (NHW)(COZ)CH-CH_2-C(=O)· radical.

78. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$(CH_2)_3$-NH-C(=NH)O· radical; and

B is a (NHW)(COZ)CH-$(CH_2)_2$-C(=O)· radical.

79. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$(CH_2)_4O$· radical; and

B is a (NHW)(COZ)CH-$(CH_2)_2$-C(=O)· radical.

80. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-CH_2O· radical; and

B is a (NHW)(COZ)CH-$(CH_2)_2$-C(=O)· radical.

81. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$CHCH_3O$· radical; and

B is a (NHW)(COZ)CH-$(CH_2)_2$-C(=O)· radical.

82. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-CH_2-C_6H_4 p-O· radical; and

B is a (NHW)(COZ)CH-$(CH_2)_2$-C(=O)· radical.

83. The polymer of claim 69, wherein:

A is a Y-CO-CHR_A-O· radical; and

B is a (NHW)(COZ)CH-$(CH_2)_2$-C(=O)· radical.

84. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$(CH_2)_3$-NH-C(=NH)O· radical; and

B is a WNHCHR_BC(=O)· radical.

85. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$(CH_2)_4$O· radical; and

B is a WNHCHR_BC(=O)· radical.

86. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-CH_2O· radical; and

B is a WNHCHR_BC(=O)· radical.

87. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-$CHCH_3$O· radical; and

B is a WNHCHR_BC(=O)· radical.

88. The polymer of claim 69, wherein:

A is a (NHX)(COY)CH-CH_2-C_6H_4 p-O· radical; and

B is a WNHCHR_BC(=O)· radical.

89. The polymer of claim 69, wherein:

A is a Y-CO-CHR_A-O· radical; and

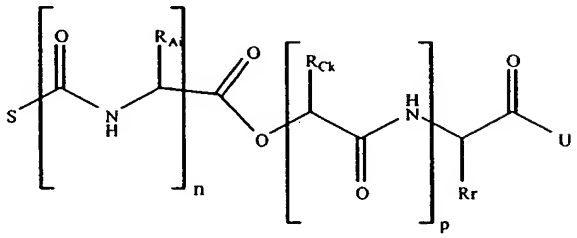
B is a WNHCHR_BC(=O)· radical.

90. A resin made of a polymer of claim 69.

91. A plastic made of a polymer of claim 69.

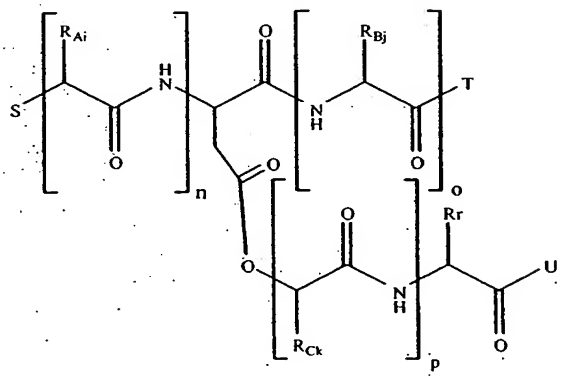
92. An article made of a polymer of claim 69.

93. A polymer of the structure:



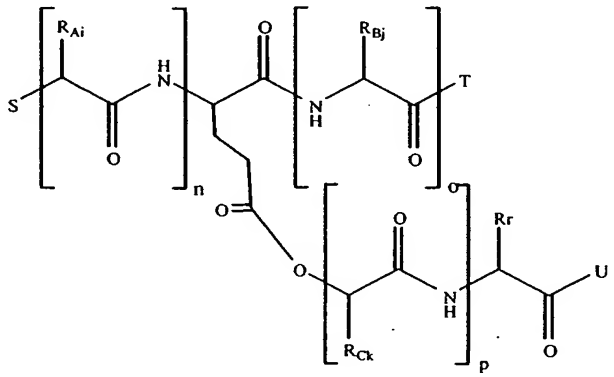
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4$OH, -CH_2OH, -CHOHCH_3, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2$COOH, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -CH$(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

94. A polymer of the structure:



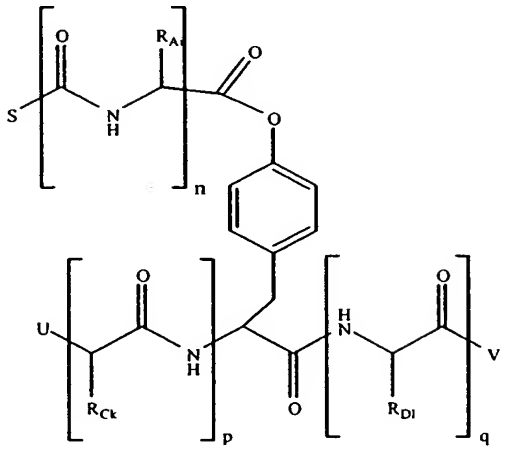
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

95. A polymer of the structure:



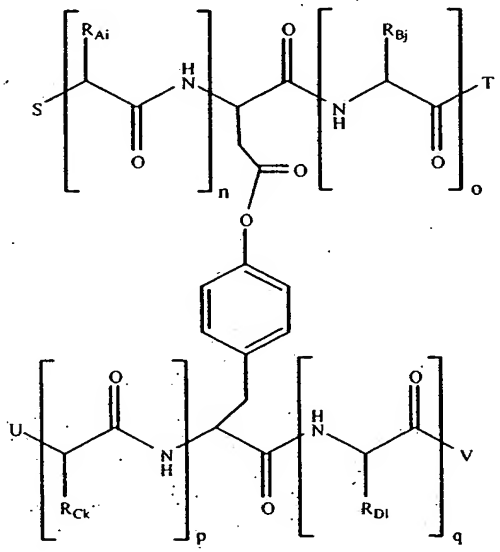
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

96. A polymer of the structure:



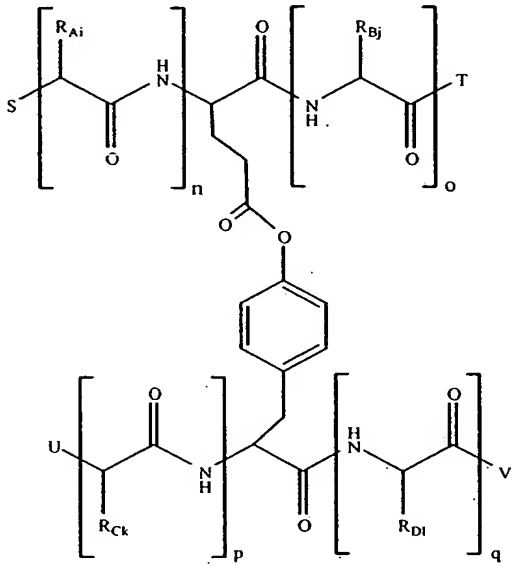
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

97. A polymer of the structure:



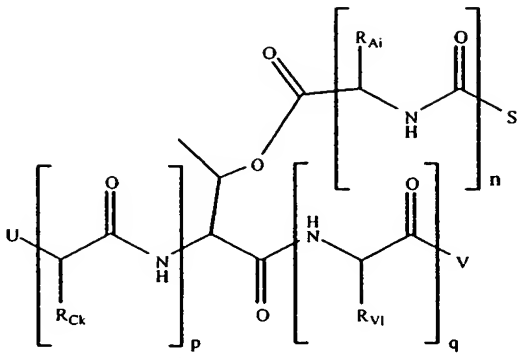
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-$C(NH_2)$(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

98. A polymer of the structure:



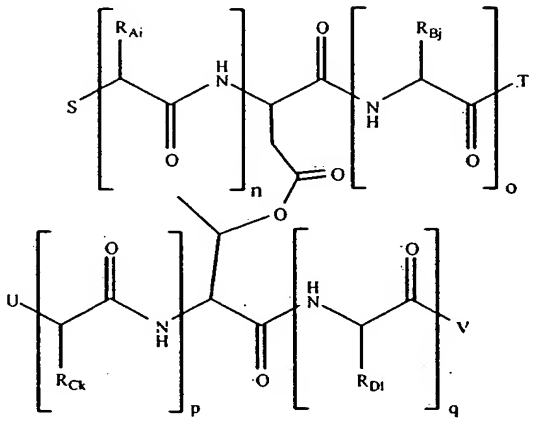
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-$C(NH_2)$(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

99. A polymer of the structure:



wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

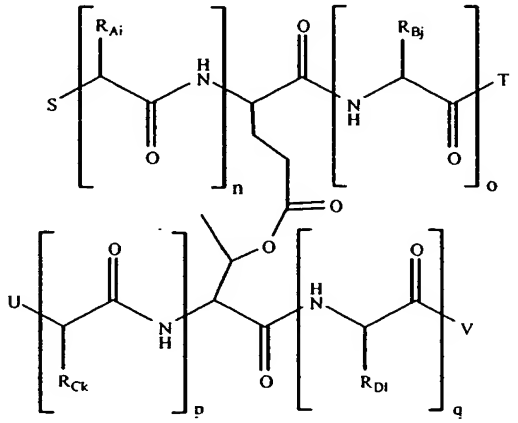
100. A polymer of the structure:



wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3,

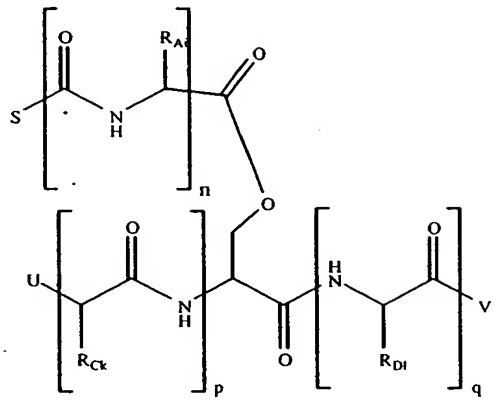
$-CH_2c(C=CH-N=CH-NH-)$, $-CH(CH_3)CH_2CH_3$, $-CH_2CH(CH_3)_2$, $-(CH_2)_2SCH_3$, $-CH_2C_6H_5$, $-CH_2-c(C=CH-NH-Ph-)$, and $-CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

101. A polymer of the structure:



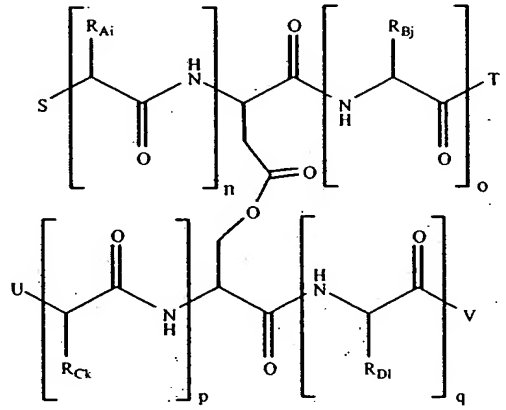
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of $-(CH_2)_3-NH-C(NH_2)(=NH)$, $-(CH_2)_3-NH-C(OH)(=NH)$, $-(CH_2)_4NH_2$, $-(CH_2)_4OH$, $-CH_2OH$, $-CHOHCH_3$, $-CH_2-C_6H_4$ p-OH, $-CH_2CONH_2$, $-CH_2COOH$, $-(CH_2)_2CONH_2$, $-(CH_2)_2COOH$, $-CH_2SH$, $-H$, $-CH_3$, $-CH_2c(C=CH-N=CH-NH-)$, $-CH(CH_3)CH_2CH_3$, $-CH_2CH(CH_3)_2$, $-(CH_2)_2SCH_3$, $-CH_2C_6H_5$, $-CH_2-c(C=CH-NH-Ph-)$, and $-CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

102. A polymer of the structure:



wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

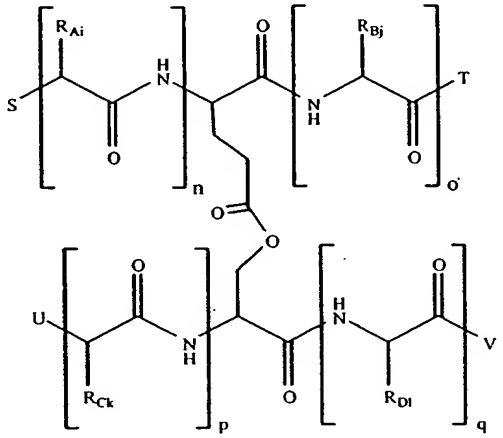
103. A polymer of the structure:



wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2,

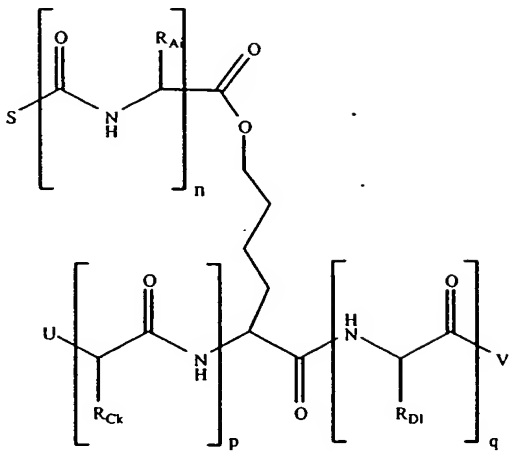
$-CH_2COOH$, $-(CH_2)_2CONH_2$, $-(CH_2)_2COOH$, $-CH_2SH$, $-H$, $-CH_3$, $-CH_2c(C=CH-N=CH-NH-)$, $-CH(CH_3)CH_2CH_3$, $-CH_2CH(CH_3)_2$, $-(CH_2)_2SCH_3$, $-CH_2C_6H_5$, $-CH_2-c(C=CH-NH-Ph-)$, and $-CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

104. A polymer of the structure:



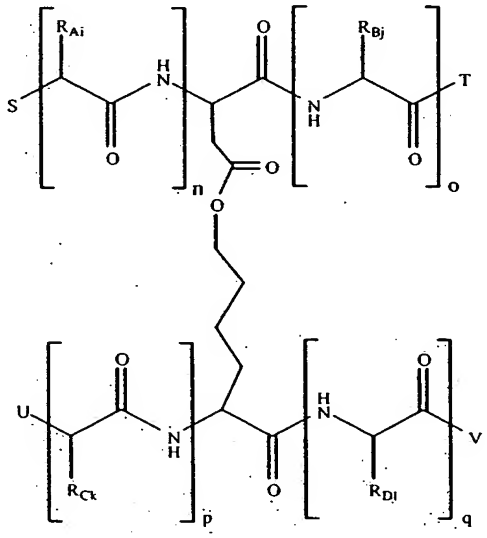
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of $-(CH_2)_3-NH-C(NH_2)(=NH)$, $-(CH_2)_3-NH-C(OH)(=NH)$, $-(CH_2)_4NH_2$, $-(CH_2)_4OH$, $-CH_2OH$, $-CHOHCH_3$, $-CH_2-C_6H_4$ p-OH, $-CH_2CONH_2$, $-CH_2COOH$, $-(CH_2)_2CONH_2$, $-(CH_2)_2COOH$, $-CH_2SH$, $-H$, $-CH_3$, $-CH_2c(C=CH-N=CH-NH-)$, $-CH(CH_3)CH_2CH_3$, $-CH_2CH(CH_3)_2$, $-(CH_2)_2SCH_3$, $-CH_2C_6H_5$, $-CH_2-c(C=CH-NH-Ph-)$, and $-CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

105. A polymer of the structure:



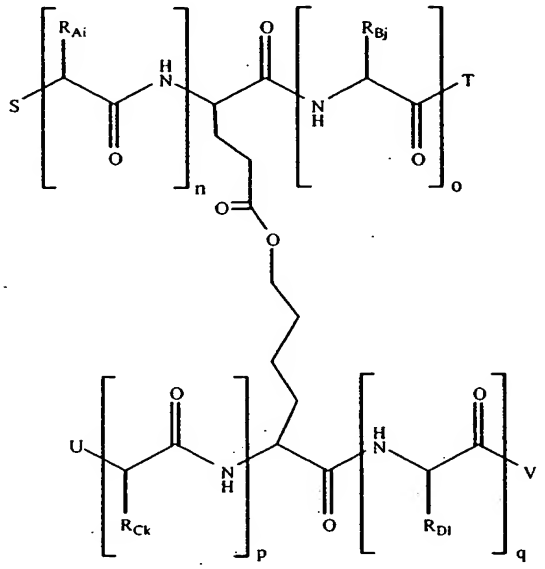
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of $-(CH_2)_3-NH-C(NH_2)(=NH)$, $-(CH_2)_3-NH-C(OH)(=NH)$, $-(CH_2)_4NH_2$, $-(CH_2)_4OH$, $-CH_2OH$, $-CHOHCH_3$, $-CH_2-C_6H_4$ p-OH, $-CH_2CONH_2$, $-CH_2COOH$, $-(CH_2)_2CONH_2$, $-(CH_2)_2COOH$, $-CH_2SH$, –H, $-CH_3$, $-CH_2c(C=CH-N=CH-NH-)$, $-CH(CH_3)CH_2CH_3$, $-CH_2CH(CH_3)_2$, $-(CH_2)_2SCH_3$, $-CH_2C_6H_5$, $-CH_2-c(C=CH-NH-Ph-)$, and $-CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

106. A polymer of the structure:



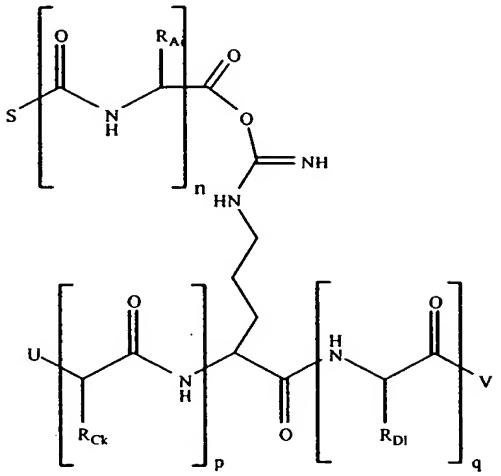
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-$C(NH_2)$(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

107. A polymer of the structure:



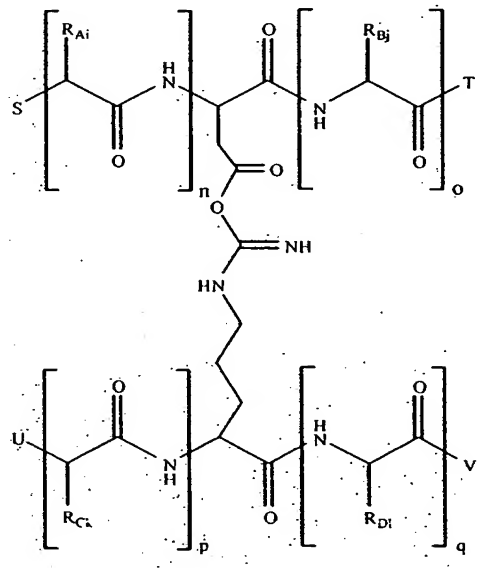
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-$C(NH_2)$(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

108. A polymer of the structure:



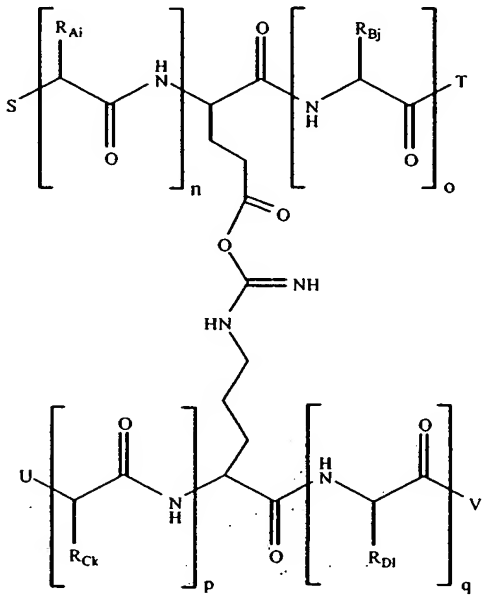
wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

109. A polymer of the structure:



wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

110. A polymer of the structure:



wherein n, o, p and q are 0 or a positive integer; i, j, k and l, if existing, are from 1 to n, o, p and q, respectively; each R_r, R_{Ai}, R_{Bj}, R_{Ck} and R_{Dl} is independently selected from the group consisting of -$(CH_2)_3$-NH-C(NH_2)(=NH), -$(CH_2)_3$-NH-C(OH)(=NH), -$(CH_2)_4NH_2$, -$(CH_2)_4OH$, -CH_2OH, -$CHOHCH_3$, -CH_2-C_6H_4 p-OH, -CH_2CONH_2, -CH_2COOH, -$(CH_2)_2CONH_2$, -$(CH_2)_2COOH$, -CH_2SH, –H, -CH_3, -CH_2c(C=CH-N=CH-NH-), -$CH(CH_3)CH_2CH_3$, -$CH_2CH(CH_3)_2$, -$(CH_2)_2SCH_3$, -$CH_2C_6H_5$, -CH_2-c(C=CH-NH-Ph-), and –$CH(CH_3)_2$; and, wherein S, T, U and V is independently selected from the group consisting of H, OH, NH_2 or a proteinaceous material.

111. The polymer of any one of claims 93 - 110, wherein n, o, p and q are at least 1.

112. The polymer of any one of claims 93 - 110, wherein n, o, p and q are at least 2.

113. The polymer of any one of claims 93 - 110, wherein n, o, p and q are at least 3.